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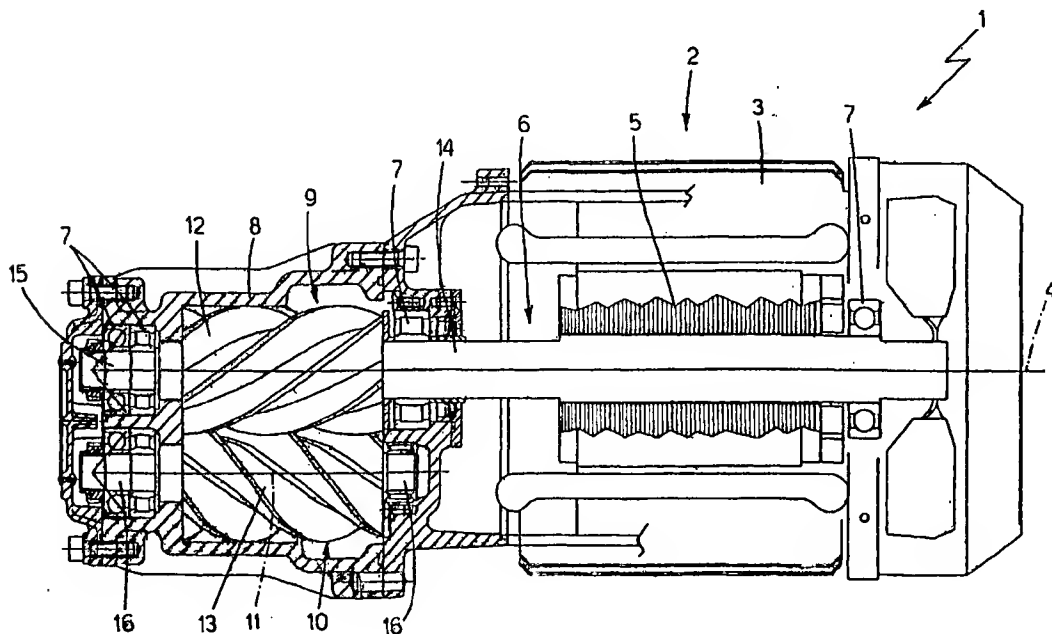
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(54) **Screw compressor**

(57) A screw compressor has an electric motor (2) having a given longitudinal axis (4), and two intermeshing rotors (9, 10); the electric motor (2) having an output

shaft (6) also defining the output shaft of that (9) of the two rotors (9, 10) which is coaxial to the longitudinal axis (4) of the electric motor (2).



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## Description

[0001] The present invention relates to a screw compressor.

[0002] More specifically, the present invention relates to a screw compressor of the type comprising an electric motor with a first output shaft; two intermeshing rotors, one of which has a second output shaft substantially coaxial with and facing the first shaft; and connecting means for connecting the first and second shaft in angularly fixed manner.

[0003] Normally, said connecting means comprise an elastic joint, in turn comprising two half-joints interference-fitted respectively to the first and second shaft; and a rubber ring interposed between the two half-joints.

[0004] The compressor also comprises two bearings between the rotors and the electric motor, for respectively supporting the first and second shaft in rotary manner. More specifically, the bearing supporting the first shaft is housed inside a tubular housing interposed between a first tubular casing housing the two rotors, and a second tubular casing housing the electric motor.

[0005] As a result, known screw compressors of the above type are relatively long, and are fairly expensive owing to the presence of the elastic joint, the two bearings supporting the first and second shaft, and the tubular housing.

[0006] Moreover, the two half-joints must be expanded thermally to engage the first and second shaft in axially sliding manner, so that fitting and removing the half-joints to and from the shafts are relatively painstaking jobs.

[0007] It is an object of the present invention to provide a screw compressor designed to eliminate the aforementioned drawbacks.

[0008] According to the present invention, there is provided a screw compressor comprising an electric motor having a given longitudinal axis; and two intermeshing rotors, a first of said rotors being substantially coaxial with said longitudinal axis; characterized by also comprising a single output shaft defining the output shaft of both said electric motor and said first rotor.

[0009] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawing showing an axial section.

[0010] Number 1 in the accompanying drawing indicates as a whole a screw compressor comprising an electric motor 2 having a tubular outer casing 3, which has a substantially horizontal longitudinal axis 4 and houses a rotor 5 fitted to an output shaft 6 substantially coaxial with axis 4.

[0011] More specifically, shaft 6 is mounted to rotate about axis 4 with respect to casing 3 and via the interposition of rolling bearings 7.

[0012] Compressor 1 also comprises a tubular outer casing 8 connected directly to casing 3 and housing two rotors 9, 10, which are rotated by motor 2 with respect

to casing 8, one about axis 4, and the other about an axis 11 substantially parallel to axis 4.

[0013] Each rotor 9, 10 comprises a central portion 12, 13, which is coaxial with respective axis 4, 11, has a symmetrically helical outer contour, and meshes with portion 13, 12 of the other rotor 10, 9 to compress a fluid inside casing 8 as the two rotors 9, 10 are counter-rotated by motor 2.

[0014] With reference to the accompanying drawing, portion 12 is fitted through with shaft 6, and is connected in angularly fixed manner to shaft 6, which therefore comprises a central portion 14 located between rotors 5 and 9 and supported in rotary manner by a single rolling bearing 7, and a lateral portion 15 located at the opposite end of portion 12 to portion 14.

[0015] In a variation not shown, portion 12 of rotor 9 is formed in one piece with shaft 6, and rotor 5 of electric motor 2 is fitted to shaft 6.

[0016] Rotor 10 comprises two shanks 16, which are preferably, though not necessarily, formed in one piece with portion 13, are located at opposite ends of portion 13, and are coaxial with axis 11.

[0017] In a variation not shown, shanks 16 define the end portions of a relative output shaft to which portion 13 is fitted.

[0018] In a further variation not shown, shaft 6 may define the output shaft of motor 2 and of rotor 10.

[0019] Operation of compressor 1 is easily deducible from the foregoing description with no further explanation required.

[0020] The fact that a single shaft 6 defines the output shaft of both electric motor 2 and rotor 9 has several advantages, the main ones of which derive from the fact that:

the length of compressor 1, measured parallel to axis 4, is relatively short;  
central portion 14 of shaft 6 can be supported in rotary manner by a single rolling bearing 7;  
compressor 1 is relatively easy to assemble and disassemble;  
rotors 5 and 9 are perfectly coaxial; and  
if compressor 1 is positioned with axis 4 vertical and with motor 2 beneath rotors 9, 10, the rolling bearing 7 supporting the portion of shaft 6 extending above motor 2 can also be eliminated.

## Claims

1. A screw compressor comprising an electric motor (2) having a given longitudinal axis (4); and two intermeshing rotors (9, 10), a first (9) of said rotors (9, 10) being substantially coaxial with said longitudinal axis (4); characterized by also comprising a single output shaft (6) defining the output shaft of both said electric motor (2) and said first rotor (9).

2. A compressor as claimed in Claim 1, wherein said output shaft (6) is formed in one piece with said first rotor (9).
3. A compressor as claimed in Claim 1, wherein said first rotor (9) is connected in angularly fixed manner to said output shaft (6). 5
4. A compressor as claimed in any one of the foregoing Claims, wherein said output shaft (6) comprises a central portion (14) located between said electric motor (2) and said first rotor (9); a single bearing (7) supporting said output shaft (6) in rotary manner at said central portion (14). 10
5. A compressor as claimed in any one of the foregoing Claims, wherein said electric motor (2) comprises a first tubular outer casing (3); the compressor also comprising a second tubular outer casing (8) housing said rotors (9, 10) and connected directly to said first tubular outer casing (3). 15 20

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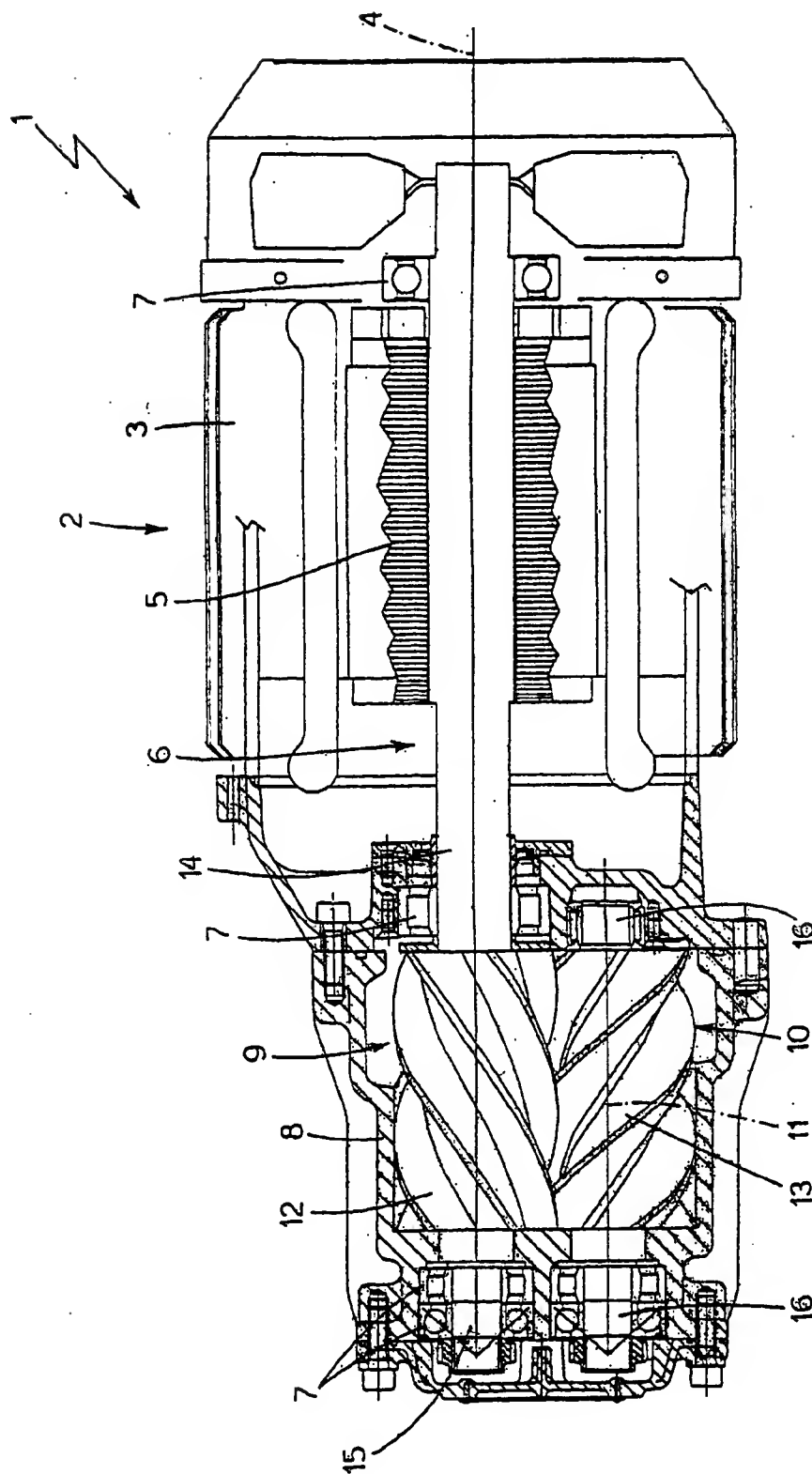
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## EUROPEAN SEARCH REPORT

Application Number  
EP 01 12 7272

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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X	US 4 311 440 A (EBERHARDT) 19 January 1982 (1982-01-19) * column 2, line 19 - line 50; figure 1 * * column 3, line 20 - line 42 * * column 4, line 46 - line 56 * -----	1,3-5	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>18 January 2002</b>	Exam. no. <b>Kapoulas, T</b>
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date O : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82